EXTERNAL DATABASE ADMINISTRATOR'S GUIDE

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1. Introduction

This document contains a general description of External DB features available in Administration interface of TEKLYNX CENTRAL Printing Interface.

The set of features described in this document are targeted on configuration of the following requirements:

- Obtaining the label data from external database
- Batch printing of labels assigned to specific products
- Confidentiality and integrity of label/products data
- Filtering the main data from external database based on additional properties (table columns)
- Uniqueness of labels printed
- Reset of connections

Section 2 of this document contains a description of new and updated configuration elements.

Section 3 contains additional notes administrators should consider while configuring Printing Interface.

For detailed configuration of Printing Interface please review internal application help file. Additional technical information and guides are provided in References section.

2. Configuration

2.1 Options

Printing Interface Administrator's interface has several new features configurable on the Options page as shown on the image below:

Figure 1 – Options configuration form

When you enable "Use external database" option the set of related options become available.

2.1.1 Check all print items

This option controls a default behavior of Printing Interface which automatically defines a set of labels that should be included to the batch printing.

If this feature is **enabled** then all products loaded to the grid according to user-defined filter selection (or product/workorder name entered) will be checked by default (included to batch printing request). **Otherwise**, all grid items will be unchecked by default (excluded from batch printing).

2.1.2 Hide variables

When this option is enabled the label variables form will not be visible in Printing Interface. Thus the user will not be able to change values of label variables. The data for them will be obtained at print-time according to the configuration of label data.

2.1.3 Variable Configuration Scope

Depending on the schema of external database the system may be configured to use appropriate label's variables data. The following scopes are available:

- Common (targets all labels)

When this scope is selected label data will be configured on per-variable basis. This scope is best suited for cases, when you have the same set of variables on multiple labels. For example, if there are two labels Label A and Label B, both having variable VAR1, you should define the data only for a single label (say Label A). The system will translate provided configuration for all labels having VAR1 variable.

- Label (targets specified label)

This scope allows configuration of label data on per-label basis and is best suited for cases, when you have multiple labels with different variables. Thus, when you define data for VAR1 on Label A, its values will be appropriate only for that label.

- Label & Product (targets label and product combination)

This scope allows configuration of label data on per-product basis. Use this scope when you need to distinguish label data in different products, even if these products contain the same labels. Considering there are PRODUCT X and PRODUCT Y, both hosting Label A, the label data should be defined separately for these two products.

Once set, the **Variable Configuration Scope** is used globally for processing the data from external database.

2.2 Workorders

NOTE: Configuration on this page may only be made if the "Work order" option is enabled on Options page.

Figure 2 – Work Orders configuration form

The general workflow of configuration is described in Printing Interface Administration's help file (see section "External Database mode").

Filters assigned to configuration of work orders will be displayed on Printing Interface before the **Work order** search field and will be used to filter the set of available work order suggestions and products data.

Filters which are added to configuration of work orders can be set as **required**. The user will not be able to perform a seach without selection of values in required filters.

NOTE: The system should already have appropriate filters configured before adding them to configuration on this page. See Filters section and application's help file for details.

2.3 Products

NOTE: If "Work order" option is enabled on Options page it is required to configure column mappings on Workorders page prior to make any configurations on Products page.

Products

Union	Key Field	Filter Name	Required	Filter Sample Values	
AND	material	PL_STATIC_MATERIAL	☑	CARTON	Edit

pname	material
PRODUCT_118	Carton
PRODUCT_136	Carton
PRODUCT_16	Carton
PRODUCT_169	Carton
PRODUCT_17	Carton
PRODUCT_183	Carton
PRODUCT_21	Carton
PRODUCT_236	Carton
PRODUCT_262	Carton
PRODUCT_311	Carton
PRODUCT_35	Carton
PRODUCT_354	Carton
PRODUCT_360	Carton
PRODUCT_4	Carton
PRODUCT_440	Carton
PRODUCT_449	Carton
PRODUCT_464	Carton
PRODUCT_476	Carton
PRODUCT_490	Carton
PRODUCT_502	Carton
1	2	3

Figure 3 - Products configuration form

The general workflow of configuration is described in Printing Interface Administration's help file (see section "External Database mode").

If application is not configured with Work Order option, then filters assigned on Products page will be displayed before Product search field, otherwise they will appear under the search field after the first search request is sent.

Filters assigned to configuration of Products can also be marked as required.

Required filters will not allow search request to be sent until the value in their corresponding dropdowns is selected.

NOTE: The system should already have appropriate filters configured before adding them to configuration on this page. See Filters section and application's help file for details.

If the filter you want to add to configuration refers *[APPLICATION].SelectedProduct* variable the system will generate an error message.

Figure 4 – Error message of using filter with incompatible variable on Products form

2.4 Labels

Figure 5 – Labels configuration form

The general workflow of configuration is described in Printing Interface Administration's help file (see section "External Database mode").
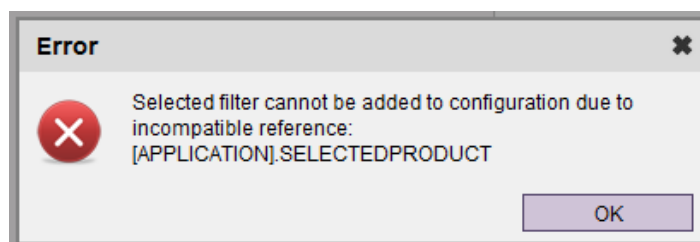
There are several new configuration fields available on this form:

- Quantity

This field allows setting of SQL-based query which should be executed on external database to retrieve a value for quantity parameter (@*LABEL_QUANTITY* in SENTINEL) when printing single label (either in single printing request or batch printing request). If this field is empty then default value is used (default value = 1).

- Copies

Allows setting of SQL-based query which should be executed on external database to retrieve a value for copies parameter (@*LABEL_COPY* in SENTINEL) when printing single label. If this field is empty the default value is used (default value = 1).

- Successful Print Action

Allows setting of SQL-based statement which should be executed on external database after single label is successfully printed. This setting may be used when label, product or workorder data should be updated (or removed) from external database after printing.

Application variables prefixed with *[APPLICATION]* token are supported when defining queries for three fields mentioned above.

additional tools like SQL Server Management Studio). The system will execute any statement provided, no matter how complex it is:

DELETE FROM [Product] WHERE [pid] = [APPLICATION].SelectedProductID;
IF NOT EXISTS (SELECT TOP 1 [pid] FROM [Product] WHERE [workorder_id] = [APPLICATION].SelectedWorkOrderID)
BEGIN
DELETE FROM [WorkOrder] WHERE [wid] = [APPLICATION].SelectedWorkOrderID;
END

Filters assigned to Labels are always displayed after the product/workorder search field, unless the filter is referenced in another filter assigned on Products or Work Orders page (see Section 2.5.1 for details).

Filters which are added to configuration of Labels can also be marked as required.

NOTE: The system should already have appropriate filters configured before adding them to configuration on this page. See Section 2.5 and application's help file for details.

2.4.1 Define Label Data

As mentioned in Section 2.1.3 the label data is defined based on **Variable Configuration Scope** selected on the Options page.

Depending on the selected scope the dialog under **Define Label Data** button operates either on a label selected from a dropdown (if scope is set to **Common** or **Label**), or a label selected in the test grid of Labels page (if scope is set to **Label & Product**).
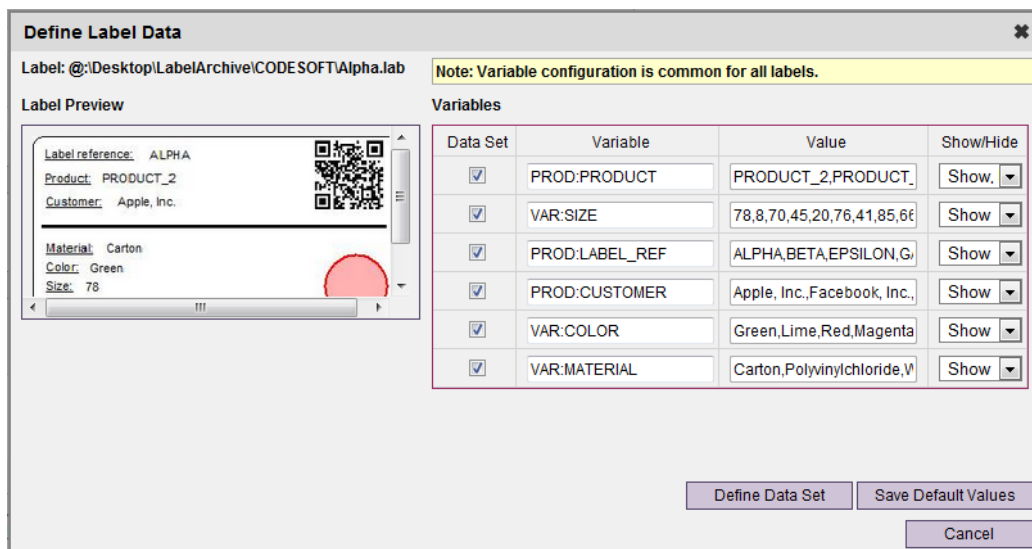
Figure 6 – Define Label Data dialog

NOTE: **Define Label Data** dialog has a yellow hint which shows the information about currently selected variable configuration scope

When defining label data you can use three different sources for variable values which will be used during printing: **Static Values**, **From a table** (Database Column) or **SQL** query (see Figure 7). If you choose **SQL** query there is a possibility to define a query having references to application variables in SQL WHERE predicates (see Section 2.6 for details).
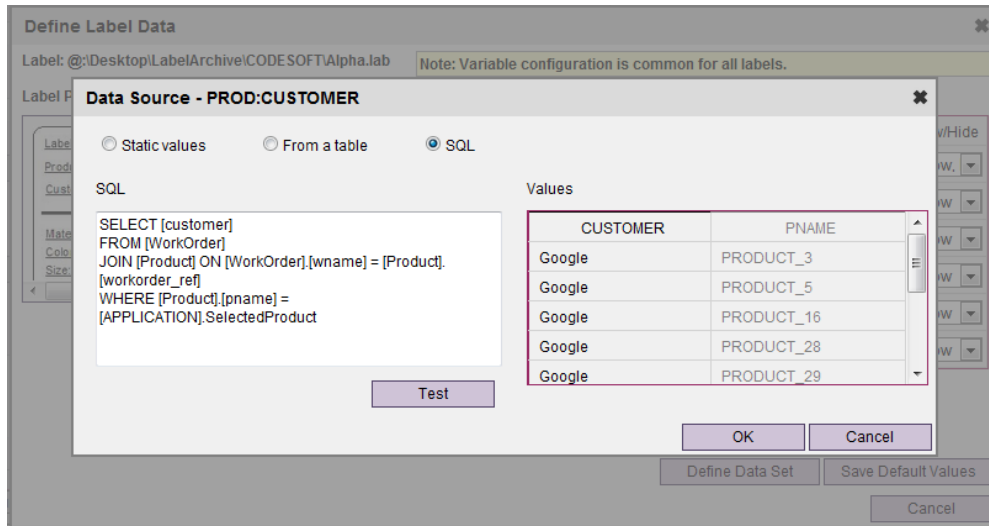
Figure 7 – Data Source dialog for a single label variable

The **Test** button in Data Source dialog is used for retrieving test results as well as validating the correctness of provided query. Test results contain top 10 records obtained from external database, ignoring references to application variables, but including their correspondent columns in test results (they are displayed with gray foreground).

2.5 Filters

Filters are used in Priting Interface to provide a possibility to filter product data based on values of additional columns in external database tables. As with data sources for variables there are three ways to configure a single filter:

- Static Values
- Database Column
- SQL query
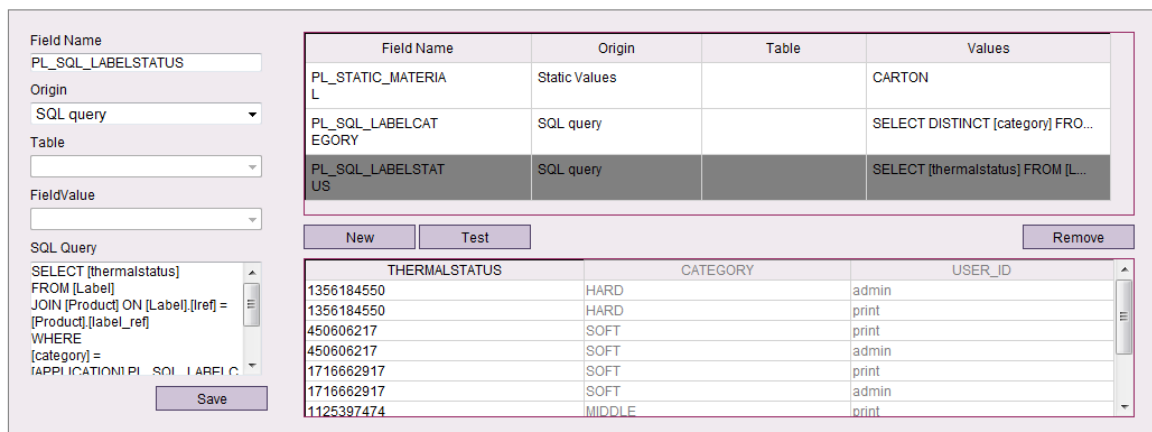
Figure 8 – Filters configuration form

When using SQL query as filter data source there is a possibility to include application variables to limit data available for this filter when it is displayed in Printing Interface (see Section 2.6 for details).

Test button allows observing top 10 results returned from external database. All columns specified in SQL WHERE clause are dispalyed with gray foreground.

2.5.1 Reference to another filter

Filters of SQL query data origin may contain reference to another filter. For example, if you created a filter named *MaterialFilter* with static values, then you can create a filter named *ColorFilter* with the following configuration query:

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SELECT DISTINCT [Color] FROM [Product]

WHERE [Material] = [APPLICATION].MaterialFilter

> NOTE: Reference to another filter should begin with `[APPLICATION]` key.

With such configuration the set of values available in the *ColorFilter* dropdown will depend on a value selected from *MaterialFilter* dropdown. If the value for *MaterialFilter* is not provided by the user, then *ColorFilter* dropdown will contain all values ignoring the dependency from referenced filter.

> NOTE: In Printing Interface the filter's dropdown will be disabled until the value of required referenced filter is selected.

The following figure shows an example of configuration provided above and how filter dropdowns are organized on Printing Interface (both *ColorFilter* and *MaterialFilter* are assgined to configuration of Products page):

Figure 9 – Example of displaying referenced filter

Referenced filter is displayed before the filter which contains a reference to it, so the *MaterialFilter* comes first.

> NOTE: The single filter query can contain only one reference to another filter.

> NOTE: The referenced filter should be created before referencing it in another filter.

2.5.2 Data confidentiality

The filters also provide a feature of data confidentiality within external database mode. This feature is based on using application variables within the filter's configuration (see Section 2.6 for details).

For example, there could be a column named `[username]` in external database which contains UMSS username assigned to specific workorder/product. You can create a filter which will automatically limit the set of workorders/products available for printing based on the username logged in to Printing Interface. This could be done with the following configuration steps:

1. On Filters page you should create new filter with **SQL query** data origin:

In case of "Work order" option, column located in WorkOrder table:

SELECT DISTINCT [username]
FROM [WorkOrder]
WHERE [username] = [APPLICATION].ConnectedUser

In case of disabled "Work order" option, column located in Product table:

SELECT DISTINCT [username]
FROM [Product]
WHERE [username] = [APPLICATION].ConnectedUser

2. Add this filter to configuration on appropriate page depending on the enabled options (Work orders, or Products).
3. Set the **Required** option for this filter.

For convenience, filters which are marked as required and contain the single value will automatically set this value as selected in appropriate dropdown.

NOTE: If data confidentiality is important, it is required to control the presence of OR conditional operators (conjunction operators) in filters settings applied on Work Orders, Products and Labels pages. The OR operator will affect the data obtained from external database based on actual filter values selected by user in Printing Interface.

2.6 Application Variables

The system provides the set of application variables which may be used in SQL-based queries throughout the TEKLYNX CENTRAL Printing Interface configuration forms. The full list of supported application variables is provided in Table 1.

Table 1 – Application variables

Application variable name	Description	Limitations
ConnectedUser	Provides access to current username logged in to Printing Interface	
Workstation	Provides access to client workstation name	
SelectedWorkOrder	Provides access to workorder name currently processed by application. The value is taken from external table column defined with the **Work Order** field on Work Orders configuration page.	Can not be used in SQL-based filters and SQL-based label data sources if "Work order" logic is disabled
SelectedProduct	Provides access to product name currently processed by application. The value is taken from external table column defined with the **Products** field on Products configuration page.	Can not be used in SQL-based filters if "Work order" option is enabled
SelectedLabel	Provides access to label name currently processed by application. The value is taken from external table column defined with **Labels** field on Labels configuration page.	Can not be used in SQL-based filters
SelectedWorkOrderID	Provides access to currently processed ID (primary key) of workorder record in external database. The value for this variable is taken from external table column defined with **Work order ID** field on Workorders configuration page.	Can not be used in SQL-based filters. Reference to this variable in SQL-based label data sources is only possible if "Work order" logic is enabled
SelectedProductID	Provides access to currently processed ID (primary key) of product record in external database. The value for this variable is taken from external table column defined with **Products ID** field on Products configuration page.	Can not be used in SQL-based filters
SelectedLabelID	Provides access to currently processed ID (primary key) of	Can not be used in SQL-based filters

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	label record in external database. The value for this variable is taken from external table column defined with **Labels ID** field on Labels configuration page.	
SelectedPrinter	Provides access to printer name currently processed by application	Can not be used in SQL-based filters
SelectedBatchPrinter	Provides access to printer name selected for batch printing operation	Can not be used in SQL-based filters

NOTE: References to application variables are only supported for SQL-based configuration elements, such as filters with SQL query data origin, SQL-based variable values, **Quantity** field**, Copies** field, **Successful Print Action** field.

Each reference to application variable should be prefixed with [APPLICATION] key. When in SQL-based query you refer to application variable or filter name do not surround variable name with square brackets ([]), only the [APPLICATION] key should have these brackets:

SELECT [qty]

FROM [Product]

WHERE [pname] = [APPLICATION].SelectedProduct

or

SELECT [user_id]

FROM [WorkOrder]

WHERE [user_id] = [APPLICATION].ConnectedUser

or

SELECT [material]

FROM [Product]

JOIN [WorkOrder] ON [Product].[workorder_ref] = [WorkOrder].[wname]

WHERE [Product].[pname] = [APPLICATION].SelectedProduct

AND [WorkOrder].[user_id] = [APPLICATION].ConnectedUser

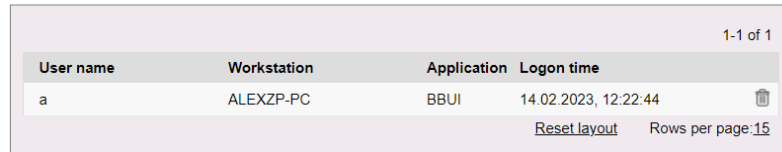For additional SQL syntax considerations review Section 3.1.

2.7 Manage Connections

Each user session initialized with Printing Interface consumes one TEKLYNX CENTRAL connection in appropriate license group. To successfully release this connection the user should explicitly log out from Printing Interface.

There are situations when users do not perform an explicit logout (using **Logout** link in Printing Interface). They simply close the browser, but the existing licensed connection remains in active state. This will not allow another user from the same UMSS group to log into application in case if license provides too few connections.

To resolve such problems with the "hung" connections the new feature is introduced in this version of TEKLYNX CENTRAL – Manage Connections page. This page is accessed from Administration interface by clicking the **Manage Connections** button on Options page.

Manage connections

User name	Workstation	Application	Logon time	
a	ALEXZP-PC	BBUI	14.02.2023, 12:22:44	🗑

1-1 of 1

Reset layout   Rows per page:15

Figure 11 – Manage Connections form

The Manage Connections form contains a list of UMSS sessions (licensed connections) initiated by Printing Interface clients. This list includes username, workstation name assigned for particular connection, as well as logon time.

The administrator is able to determine the connections which are not in use and release those connections by clicking on red "X" button.

3 Additional notes

3.1 SQL query syntax

The system does not provide full support of SQL syntax, statements and query validation. It is recommended to follow certain rules when defining queries for different configuration elements:

1. The majority of configuration elements operate only on SQL SELECT statement.
The one and the only element where more complex SQL commands and constructs could be defined is the **Successful Print Action** field on Labels page (see Section 2.4).
2. When referencing external table names and columns it is recommended to surround them with square brackets ([ ]):

SELECT [product_code]
FROM [Product]
WHERE [product_name] = 'PRODUCT_1234'

3. JOINs statements over two or three tables are supported. Make sure you refer to external column with adding the table name to column specification (note: table aliases are not currently supported):

SELECT [Product].[product_code]
FROM [Product]
JOIN [Label] ON [Product].[label_ref] = [Label].[label_ref]
WHERE [Product].[product_name] = [APPLICATION].SelectedProduct
AND [Label].[type] = 'DT_ECONOMY'

SELECT [Product].[product_code]
FROM [Product]
INNER JOIN [Label] ON [Product].[label_ref] = [Label].[label_ref]
INNER JOIN [WorkOrder] ON [Product].[workorder_ref] = [WorkOrder].[wname]
WHERE [Product].[product_name] = [APPLICATION].SelectedProduct
AND [Label].[type] = 'DT_ECONOMY'
AND [WorkOrder].[username] = [APPLICATION].ConnectedUser

4. In WHERE clause the value must follow the = sign and not precede it:

Correct:
SELECT [workorder_num]
FROM [WorkOrder]
WHERE [workorder_name] = [APPLICATION].SelectedWorkOrder

Incorrect:
SELECT [workorder_num]
FROM [WorkOrder]
WHERE [APPLICATION].SelectedWorkOrder = [workorder_name]

References

The following additional guides are provided on TEKLYNX CENTRAL installation media:

[1] TC_70_Installation_Guide.pdf
Contains detailed description of TEKLYNX CENTRAL installation process

[2] TC_70_IIS_Configuration_Guide.pdf
Contains description of configuration Internet Information Services for Printing Interface application

[3] TC_70_Upgrade_Guide.pdf
Contains description of upgrading TEKLYNX CENTRAL installation from previous version

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